

## BOTANICAL GAZETTE

MAY, 1906

NEW AND NOTEWORTHY WESTERN PLANTS. III.<sup>1</sup>

A. D. E. ELMER.

✓ **Phacelia acanthominthoides**, n. sp.—An annual or biennial, 2 to 5<sup>dm</sup> high or higher: stems many, profusely branched from the base, erect or reclining, cinereous: leaves at least in the mature plants all cauline, alternate, usually subtending the branches, those from near the base 10<sup>mm</sup> long, pinnately 3 to 5-lobed or toward the apex only pinnatifid; the pubescent petiole almost equaling the blade proper; lobes hispidly strigose on both sides, 1<sup>cm</sup> long or less, margins with few much-rounded teeth; upper leaves finer dissected and without petioles: inflorescence ample, in widely branched scirpoid racemes; flowers bluish, upon short pubescent pedicels: the 5 sepals pubescent, 4<sup>mm</sup> long, 1.5<sup>mm</sup> wide, linear-oblong, very obtuse, united at base, much exceeded by the flower: corolla 8<sup>mm</sup> long; petals 5, very short, obovate, lateral nerves extending from the middle basal primary ones: stamens 5, exserted, inserted near the corolla base and alternating with the segments; anthers elliptic, 1<sup>mm</sup> long, versatile; filaments glabrous, slender, 8 to 10<sup>mm</sup> long, with minute hyaline appendages at base: ovary ellipsoid, pubescent; style persistent, 7<sup>mm</sup> long, cleft nearly to the base, the united portion sparsely pubescent; stigmas minute, terminal: herbaceous sepals of the mature capsule 8<sup>mm</sup> long, 4<sup>mm</sup> across the widest part, ovate, acute, subcoriaceous, with ciliate margins, strongly 1-nerved with prominent reticulations: capsule 2-valved, sessile, 4-seeded: seeds dark brown 2.5<sup>mm</sup> long, oblong, triangular, pitted.

<sup>1</sup> The first four new species have been in manuscript more than two years, and the types are in the herbarium of Stanford University.

Type specimen collected in May 1903, by Miss *Laura M. Lathrop* at Hernandez, San Benito County, California.

This species can be distinguished readily by its reticulately nerved, broadly ovate, and ciliate mature calyx lobes, not unlike the bracts of *Acanthomintha ilicifolia* Gray.

**Trichostema rubisepalum**, n. sp.—Erect annual, 2 to 3<sup>dm</sup> high: stems chiefly branched from near the base, the branches usually in pairs and ascending, soft pilose and glandular, the lower ones becoming reddish: leaves cauline, opposite, entire, sessile, linear-lanceolate, pilose on both sides and finely glandular, acute or acuminate, 2<sup>cm</sup> long or longer, about 5<sup>mm</sup> wide: inflorescence in axillary short-pedunculate cymes; flowers blue, solitary, on 2 or 3 glandular pubescent pedicels, subtended by linear bracts: calyx united below the middle, bristly pilose and somewhat glandular, about 6<sup>mm</sup> long; the 5 subequal segments straight, acute, ultimately turning to a pink or light purple: corolla exceeding the calyx, 7<sup>mm</sup> long, curved, pilose, throat oblique; its segments also pilose, thin, obscurely bilabiate; upper lip somewhat shorter and 2-segmented; lower one with 3 segments: anthers much exceeding the corolla, in two pairs of unequal lengths; filaments curved, equaling the tube, slender, glabrous, apparently adnate to the entire length of the thin corolla tube; anther cells united toward the apex only, attached dorsally to the filament, ovoid, the base ultimately much spreading: style glabrous, filiform, recurved, equaling the shorter stamens and inserted in the depression of the ovary lobes; ovary short pubescent, deeply 4-lobed: seeds amphitropous.

Type specimen collected by Miss *Laura M. Lathrop* at Hernandez, San Benito County, California, August 1902.

This is closely related to *T. laxum* Gray, but distinguished by its long pilose and glandular pubescence, sessile or sessile leaves, and by its usually pilose corolla. The tips of the sepals soon turn red.

**Collinsia Hernandezii**, n. sp.—Annual, 10 to 20<sup>cm</sup> high: stems branched from the base, central ones erect, the outer reclining, soft yellowish pubescent, glandular: leaves cauline, opposite, oblong to oblanceolate, the larger ones 4<sup>cm</sup> long, 1.5<sup>cm</sup> wide, apex obtusely rounded, gradually tapering at the base to a 1<sup>cm</sup> long pubescent petiole, margins entire, short and dirty glandular pubescent on both sides, rather thick, the 3 to 5 obscure nerves parallel; upper leaves

becoming bract-like: flowers large, widely scattered along the spicate racemes, half nodding upon short glandular pubescent peduncles, subtended by leaf-like bracts: the 5 distinct sepals glandular pubescent, 5<sup>mm</sup> long, 1.5<sup>mm</sup> wide at base, acuminate: corolla bluish, 2<sup>cm</sup> long, strongly bilabiate, saccate at base, with gibbose throat; lower lip obscurely 3-lobed, the middle lobe longer and prominently conduplicate; upper lip ascending, shorter, and broadly bilobed: fertile stamens 4, equally inserted upon the tube near the base, longer pair 1.5<sup>cm</sup> long, shorter pair 2<sup>mm</sup> less, jointed and papillate at base; filaments winged, downwardly recurved, glabrous or the longer ones glandular above the middle; fifth stamen represented by an oblong membranous pouch on the lower portion of the corolla tube; anthers 2-celled, round or reniform, cells united at apex: ovary soft pubescent and finely glandular; style usually straight, thick, about equaling the stamens, sparsely glandular toward the base.

Type specimen collected by Miss *Laura M. Lathrop* at Hernandez, San Benito County, California, June 1903.

Its habit and pubescence is that of *C. Greenei* Gray, but the leaves and flowers are different.

***Fritillaria succulenta***, n. sp.—Stems glabrous, erect, simple, 2 to 3<sup>dm</sup> high, from a bulb of fleshy scales: basal leaves ascending, 5 to 10<sup>cm</sup> long, 2 to 3<sup>cm</sup> wide, in pairs or in whorls of three, elliptic-oblong, obtuse, succulent and covered with a bloom; cauline ones few, erect, alternate or the lower in pairs, lanceolate, also fleshy and glaucous: flowers solitary or on the larger plants in racemes of three, nodding; peduncle subtended by a leaf-like bract, glabrous, 1 to 2<sup>cm</sup> long: perianth campanulate, 2 to 3<sup>cm</sup> long, wider than that when spreading; the 6 segments 2 to 3<sup>cm</sup> long, obtuse, oblanceolate to obovate, glabrous beneath, purple, entire, margins at apex yellowish, numerous striate with darker purple and the upper surface pulverulent or obscurely crested: stamens 6, inserted upon the base of the segments, included; anthers 3 to 4<sup>mm</sup> long, elliptic-oblong, versatile, extrorse; filaments 8<sup>mm</sup> long, glabrous, more or less expanded toward the base: style 1<sup>cm</sup> long, glabrous, cleft into three segments half way down, the recurved segments subcompressed and bearing terminal stigmas; ovary smooth, truncate at apex.

Type specimen collected in April 1903 by Miss *Laura M. Lathrop*, at Hernandez, San Benito County, California.

Its leaves are quite thick and fleshy, and are usually glaucous on both sides.

**Sanicula serpentina**, n. sp.—Low spreading biennial or perennial herb, from slender rootstocks, 2<sup>dm</sup> high or less, wholly glabrous and frequently somewhat glaucous, a rich brown color when cured: stems chiefly branched from the base, the central one erect, the marginal ones ascending: leaves mostly from the base, subtending the branches, the radical ones upon membranously flattened 3-nerved petioles 2<sup>cm</sup> long; blade proper 2<sup>cm</sup> long or longer, ovate in outline, 3<sup>cm</sup> across the base, pinnately divided into lacinate lobes which are again divided into slender acuminate usually somewhat recurved and sharply pointed segments: inflorescence branched from near the base, long-pedunculate; involucre of sessile leaf-like bracts; heads 3 to 5, the peduncles of the lateral heads usually much shorter at least when in flower, densely flowered, about 4<sup>mm</sup> in diameter; involucels of entire lanceolate bracts slightly shorter than the yellow flowers; marginal flowers sterile, pedicelled, the fewer inner ones sessile and fertile: calyx 5-toothed: petals 1-nerved, quite broad across the middle, the setaceous acuminate apex strongly inflexed and emarginate on its bend: stamens incurved near the apex; anthers broadly elliptic, 0.5<sup>mm</sup> long: ovary with uncinata prickles; styles 2, slender, recurved, each persistent from the inner face of the stylopodium: fruit not observed.

Type specimen no. 4498, collected in April 1903 near Portola, San Mateo County, California.

This form is nearest related to *S. laciniata* H. and A., but the latter is a much more rigid herb, with coarser, broader, spinosely toothed leaf divisions; and with the bracts of the involucels often 3-parted or at least 3-nerved from near the middle. It was discovered on serpentine rocks near Searsville Lake, of the chaparral formation.

**Trifolium bicephalum**, n. sp.—More or less tufted, from an annual root: stems slender, 8 to 18<sup>cm</sup> long, decumbent or the outer ones prostrate, rather numerous from the base, rarely branched, sparsely pubescent: leaves both radical and cauline, the basal ones somewhat smaller and more numerous, with slender flexuous pubescent petioles 2<sup>cm</sup> in length; stipules adnate, 6<sup>mm</sup> long, membranous, strongly nerved, subglabrous or finely ciliate along the edges, terminated by two setae 2<sup>mm</sup> long; leaflets 7<sup>mm</sup> long, 4<sup>mm</sup> wide, soft pubes-

cent with brownish hairs, obovate or truncate and usually emarginate, entire or obscurely dentate above the middle, with prominent ascending nerves beneath: peduncles pubescent, equaling half the length of the stem or branch, subflexuose above the middle; bicephalous heads terminal, sessile, unequal in size, each subtended by a subsessile trifoliate leaf with broad ovate stipules; involucre none: calyx densely pubescent, 4<sup>mm</sup> long including the 2<sup>mm</sup> sharply acuminate teeth: corolla exceeding the calyx teeth by 1 or 2<sup>mm</sup>, hyaline and united with a staminal tube below the middle; upper lip whitish, obovately rounded and surrounding the lateral lobes or wings; lateral lobes oblongish, slightly shorter than the banner, obtuse or acute apical portion nearly white, the middle portion purple, the basal portion hyaline and with an auricle; keel obtuse, shorter than the wings, purplish: anthers very small: ovary glabrous, 2-ovulate; style glabrous, equaling the stamens, terminally recurved, bearing a capitate stigma.

Type specimen no. 4812, collected at San Pedro, San Mateo County, California, May 1903.

This species comes nearest to the so-called Californian *T. Macraei* H. and A., but is a much smaller and more prostrate clover, with leaves distinctly obovate and emarginate. It forms dense prostrate mats on a high promontory near the sea.

**Eriophyllum Greenei**, n. sp.—A caespitose perennial, from a woody base: stems many from the crown, lanate, branched above the middle: leaves numerous on the sterile stem, the lower ones opposite, the upper ones alternate, petiolate, triangularly ovate in outline, 2 to 3-pinnately divided, lanose on both sides; the segments short, blunt, very narrow, with incurved margins inclosing a dense matrix of woolly hairs; petiole about equaling the blade, as broad as the segments with edges incurved: heads heterogamous, solitary, terminating the leafy branches, ovoid, 1<sup>cm</sup> broad; peduncle white tomentose, without bracts; involucre quite rigid, cup-shaped, densely lanate, united at base; bracts in one series, acute, 10<sup>mm</sup> in length: ray flowers light yellow, 15<sup>mm</sup> long including the achene, pistillate; tube 2<sup>mm</sup> long, pubescent, ligule 8<sup>mm</sup> long, 3<sup>mm</sup> wide, obovate or oblanceolate, many-nerved, apex obscurely 3-toothed: style arms 1<sup>mm</sup> long, narrowly flattened, obtuse: receptacle obscurely pitted, somewhat raised and subconic: disk flowers perfect, very numerous,

6<sup>cm</sup> long with the achenes: tubular corolla yellow, sparsely pubescent, terminated by 5 obtuse segments: anthers 1.5<sup>mm</sup> long, with apex triangularly ovate, bases obscurely auriculate; filaments barely as long, inserted upon the middle of the tube: style arms flattened, bearing small capitate stigmas: achene brownish black, 3<sup>mm</sup> long, usually curved and attenuate from the base, subcompressed or 4-angled, edges ciliate: pappus persistent, less than 1<sup>mm</sup> in length, of unequal paleae.

Type specimen no. 4335, collected in the Mocho Creek Canyon, Alameda County, California, May 1903.

It is intermediate between *E. arachnoideum* Greene and *E. caespitosum* Dougl., but sufficiently distinct from either. Named for Professor E. L. GREENE.

**Navarretia Abramsi**, n. sp.—Densely lanose herbs, about 6<sup>cm</sup> high: stems solitary or several from the base, rigidly erect, chiefly branched from the middle; branches rather stout and straight, ascending, terminated by solitary comparatively large heads: leaves mostly subtending the heads, the larger ones 2<sup>cm</sup> long, 1 or 2-lacinately divided, soon becoming dry and brittle; the lobes very narrow, becoming glabrous, usually recurved and terminated by a fine sharp point: heads turbinate, the larger ones 1<sup>cm</sup> across at top, densely surrounded by a matrix of lanate hairs, 6 to 10-flowered, the subtending bracts similar to the leaves but smaller: corolla easily separating from the base, 8<sup>mm</sup> long including the 3<sup>mm</sup> long segments, bluish or nearly white, glabrous, hyaline, conspicuously nerved; segments 5, subequally divided, linear spatulate, entire or finely dentate at apex: stamens 5, barely exceeding the throat of the corolla, subequal in length, filaments threadlike, subequally inserted upon the tube 2<sup>mm</sup> below the throat; anthers ovate or elliptic, 1<sup>mm</sup> long, apex obtuse, base sagittate: style persistent, glabrous, minutely lobed at apex: calyx of the mature capsule 6<sup>mm</sup> long, divided nearly to the base; the sepals straight and erect, linear, hyaline below the middle, held intact by the hairy matrix; the upper part of the sepals glabrous, foliaceous, and acuminate pointed: capsule triangular, when mature easily falling out from the persistent calyx, straw-colored, smooth and shining, 4<sup>mm</sup> long, 1.5<sup>mm</sup> in diameter, apex pointed, 3-celled, loculicidally dehiscent: seeds solitary in each cell, subterete, 3<sup>mm</sup> long, brown and very hard, with a gelatinous cover which readily dissolves in water.

Type specimen no. 4586, collected on Black Mountain, Santa Clara County, California, July 1905.

It is a very late summer-flowering annual, chiefly confined to dry gravelly soil immediately bordering thickets of the Californian chamiso (*Adenostoma fasciculatum* H. and A.). Named for Mr. L. R. ABRAMS, a former student of botany and classmate at Stanford University.

**Ribes Stanfordii**, n. sp.—A rigidly branched shrub, 1 to 1.5<sup>m</sup> high, nearly as broad: bark on the younger branches light brown, becoming grayish white with age, thin, separating into shreds; branchlets subtended and protected by 3 spines, very short and rigid; spines about 1<sup>cm</sup> long, straight, shining brown, divaricate, distinct, the middle ones usually longer, exceeding the axillary leafy branchlets; branchlets terminated by 1 to 3 small tufts of leaves, subtended by diminutive spines, each tuft provided with a subwhorl of 3 to 5 leaves and terminated by a small inflorescence of 1 to 3 flowers: leaves orbicular, 8<sup>mm</sup> long including the finely glandular pubescent 2 to 3<sup>mm</sup> long petiole, deeply cleft into 3 segments, soft pubescent on both sides, rather thick, the segments usually terminated by subequal obtusely rounded teeth or lobes, obscurely 3 to 5-nerved; petiole gradually expanded at base into the adnate stipules: flowers 3, upon a short and pubescent peduncle, each separately inserted and sessile, subtended by conspicuously broad pubescent bracts: calyx about the ovary densely pubescent, 3<sup>mm</sup> in diameter, its tube 2<sup>mm</sup> in diameter, less pubescent, about 2<sup>mm</sup> long, the 5 segments exceeding the corolla by 1<sup>mm</sup>, triangularly obtuse, puberulous on the outer surface, 2<sup>mm</sup> long, yellow, rotate or much reflexed: corolla deeper yellow, inserted upon the calyx throat and alternating with the segments, straight, obovate, 2<sup>mm</sup> long: anthers 5, inserted upon the calyx throat and opposite the segments, equaling the corolla; filaments glabrous, flattened, 1.5<sup>mm</sup> long: style erect, subterete, slightly exceeding the stamens: anthers ovate, obtuse at apex, light yellow, truncate or only obscurely lobed at base, 1.5<sup>mm</sup> long, 1<sup>mm</sup> wide at the base: berry yellow and pubescent at least when young.

Type specimen no. 3958, collected on Mt. Pinos near Griffin's Postoffice, Ventura County, California, July 1902.

It was discovered in open pine regions in the vicinity of cliffs and rocky outcroppings at the summit. Not common. Distributed as *R. nubigenum* McClatch.

**Pedicularis Dudleyi**, n. sp.—Perennial herbs, 2 to 3<sup>dm</sup> high, usually from a branched caudex: stems solitary from each of the scaly crowned caudices, the central ones erect, the outer ones ascending, simple or sometimes branched, not exceeding the basal leaves, lanose especially toward the base, more or less curved; basal bracts brown, lanceolate, entire, glabrous, marcescent: leaves chiefly from the base of the stem, alternate, the uppermost at about the middle of the stem but not exceeding it, the lowest ones longest and somewhat decumbent, lanceolate in outline, the larger 25<sup>cm</sup> long, 6<sup>cm</sup> wide; leaf segments about 10 pairs, subglabrous or short pubescent on the nerves, membranous; lower pairs distinctly petiolate, the upper pairs not only sessile but broadly united, those along the middle largest; each lobe ovate or oblong in outline, 3<sup>cm</sup> long, 2<sup>cm</sup> wide, cleft into irregular lobes or merely dentate, the margins unequally serrate or dentate, its teeth sharply pointed: inflorescence spicate, densely flowered, at most 5<sup>cm</sup> long and 3<sup>cm</sup> in diameter, upon peduncles equaling half the length of the stem, usually erect but frequently somewhat curved; bracts subtending the flowers, foliaceous, serrately toothed, the upper ones equaling the flowers, the lower ones much exceeding them: calyx 1<sup>cm</sup> long, unequally 5-cleft, the segments acute and obscurely toothed toward the apex, densely lanose on the exterior: corolla 2<sup>cm</sup> long, the narrow tubular part half that in length, glabrous; upper lip conduplicate, slightly notched at apex, pink or whitish, much protruding and arched; lower lip subequally 3-toothed: stamens equal; filaments glabrous; anthers broadly elliptic, attached to the basal dorsal side, the cells connate and rounded at apex, the base not united, acute: style filiform, subpersistent, thicker and more or less flattened toward the apex, conspicuously recurved and protruding from the upper lip; ovary glabrous, dark brown, 2-celled, flattened, acuminate pointed: capsule coriaceous, 12<sup>mm</sup> long, 7<sup>mm</sup> wide, acuminate terminating in an upwardly curved point: seeds about 4, black when mature, pitted, subterete or obscurely angular.

Good flower and fruit of this type specimen, no. 4289, was collected in May and June 1903, at Iverson's Ranch on the Pescadero Creek, San Mateo County, California.

Only known from this locality, where it is rare and confined to the deep shade of *Sequoia sempervirens*. Its proximity to a camping ground endangers its exist-



ence. This denizen of the Santa Cruz Mountain redwoods is named in honor of Professor W. R. DUDLEY of Stanford University, who first discovered it.

**Orthocarpus longispicatus**, n. sp.—A profusely branched decumbent biennial or perennial, forming rather dense mats: stems slender, elongated and distantly branched, often 1<sup>m</sup> in length, usually pubescent with soft glistening white hairs: leaves alternate, evenly scattered, sessile, membranous, puberulent on both sides, or with glistening hairs on the margins and along the 3 obscure nerves, cleft into 2 pairs of strap-like segments, the middle one longest: inflorescence spicate, very long and usually curved; bracts not exceeding the flowers, 5 to 7-lacinately cleft, the obtuse apices light red: calyx 4-cleft, soft pubescent, equaling the corolla, with colored tips: tube of the corolla 2<sup>cm</sup> long, externally pubescent, gradually expanded from the constriction above the ovary; upper lip 1<sup>mm</sup> longer than the lower one, rather straight, apex obtuse, finely pubescent on the lower surface, margins soft and hyaline; lower lip with 3 obtuse finely pubescent teeth which bear moderate sized sacs: stamens 4, inserted upon the middle of the corolla tube, the lateral pair shorter, the upper pair nearly equaling the galea and enclosed by it; filaments hyaline, linear-flattened, glabrous; the upper anther cell usually somewhat longer and shedding its pollen before the lower one: style persistent, glabrous, much exerted, thickened or expanded toward the base of the capitate flattened or obscurely lobed stigma; ovary oblong, truncate at the apex: capsule 10<sup>mm</sup> long, smooth, loculicidal: seeds numerous, lenticular, with broad reticulate wings.

Type specimen no. 4938, collected in July 1903, at Point Reyes, Marin County, California.

It was quite abundant among the pickle weed (*Salicornia ambigua* Michx.), along edges of brackish water. Distinguished by its long decumbent fragile stems and branches, numerous leaves, and elongated densely flowered spikes.

**Godetia lanata**, n. sp.—Erect annual, 3 to 6<sup>dm</sup> high, single or branched from near the base, quite rigid; mature stems shining, straw-colored, scaling at base into membranous shreds, with ascending branches from or above the middle; the younger branches yellowish tomentose: leaves cauline, lower ones soon falling, alternate and clustered, sessile, very unequal, cinereous on both sides, semicoriaceous, lanceolate or linear-oblong, equally tapering at both ends, acute, the larger ones 5<sup>cm</sup> long, 15<sup>mm</sup> wide, midnerve quite promi-

ment beneath, lateral ones obscure: inflorescence short, spicate or subcapitate, terminating the branches, usually densely flowered, 3 or 4<sup>cm</sup> in diameter; buds erect, from the terminal central axis; flowers easily separating from the ovary, subtended by strigose lanceolate acuminate bracts, subsessile: calyx tube obconic, 3 to 4<sup>mm</sup> long, lanose pubescent; its 5 equally pubescent segments 12<sup>mm</sup> long, acuminate and ultimately reflexed: corolla and stamens inserted upon the rim of the calyx throat; petals straight, thin, pink, broadly obovate in outline, 6<sup>mm</sup> long and wide, irregularly or obscurely 3-toothed, the middle tooth acute, usually the larger: stamens 8, in 2 series, those alternating with the petals nearly equaling them, those opposite the petals barely more than 1<sup>mm</sup> long; filaments glabrous, compressed, broadest at the base; anthers introrse, basifixed, those of the upper series twice as long as those of the lower: style glabrous or with a few long hairs, barely equaling the stamens, bearing an obscurely 4-lobed stigma; ovary densely and persistently lanose pubescent, upon short thick pedicels: capsules subtended by leaf-like bracts longer than themselves, loculicidally dehiscent from the apex, straight, erect, lanose, subsessile, apex truncate, nearly of the same thickness throughout, subterete or only slightly 4-sided, 8-costate, 4-celled, 4-valved: seeds numerous, in single rows, dark brown, subterete or cubical, a little pointed at one end.

Type specimen no. 4376, collected in June 1903 at Bardins railroad switch, Monterey County, California.

This characteristic species was found quite plentiful on the sandy plain between Monterey and Castroville, and is quite variable in the density of its pubescence branching habit, and size of leaves.

**Pentachaeta laxa**, n. sp.—A lax very much branched annual, 1 to 2 or 3<sup>dm</sup> high: stems branched from the base, softly but sparsely pilose: leaves in pairs, subtending the branches, sessile, linear, gradually tapering from the base, the larger ones 3<sup>cm</sup> long, 2<sup>mm</sup> wide, very thin, sparsely pilose on both surfaces: heads terminal, heterogamous, turbinate, 6<sup>mm</sup> long, about 9-flowered; the peduncle ascending, 1 to 4<sup>cm</sup> long, pilose, somewhat thickened toward the apex; involucre bracts 3 to 5, persistent, flat, acute, oblong, scantily pilose on the exterior, the reticulate nerves quite prominent, equaling the flowers, more or less membranous: receptacle pitted: each of the ray flowers

subtended by an involucre bract, yellow, caducous, pistillate, tube  $1^{\text{mm}}$  long, bearing a broad  $1^{\text{mm}}$  long notched ligule: style arms exceeding the ligule, recurved, acute: disk flowers perfect, tubular, light yellow and caducous,  $2^{\text{mm}}$  long, the upper half inflated, bearing 4 obtuse teeth: anthers well included,  $0.5^{\text{mm}}$  long, rather broad, bases truncate, each with a very prominent apical appendage; filaments thread-like, scarcely longer than the anther: style barely exceeding the corolla, its arms subcompressed, recurved, short, obtuse or truncate at apex: achenes subterete,  $5^{\text{mm}}$  long, black when mature, finely rugose, dotted with sessile yellowish brown glands subtended by short setae; pappus of 2 or 3 paleaceous scabrous awns, usually persistent.

Type specimen no. 4437, collected in May 1903, on Cedar Mountain of the Mount Hamilton Range, Alameda County, California.

This distinct species inhabits a steep shaded ravine of fertile soil, and forms a tangled mass with its numerous decumbent branches. Not observed elsewhere, and evidently very rare.

> **Nemophila Fremontii**, n. sp.—Delicate annual: stems procumbent or prostrate, branched, subglabrous or sparsely retrorsely pubescent, 10 to  $30^{\text{cm}}$  in length: radical leaves similar to the lower cauline ones, frequently forming a rosette,  $3^{\text{cm}}$  long including the  $1.5^{\text{cm}}$  long strigose petiole; blade membranous, ovate or oblong in outline, usually oddly pinnate with two pairs of nearly divided lobes or the uppermost merely sinuate, sparsely pubescent on both sides, paler beneath; the lobes nearly as broad as long, rounded, finely mucronate: flowers solitary, upon slender flexuose usually recurved  $2^{\text{cm}}$  long peduncles which are clothed with retrorse bristles: calyx persistent, campanulate,  $3^{\text{mm}}$  long, the basal one-third united, equaling or exceeding the corolla, pubescent with fine bristle-like hairs; sepals oblong, obtuse or acutish, foliaceous, with a short blunt recurved appendage from each sinus: corolla white, urn-shaped, its lobes becoming reflexed, at most  $3^{\text{mm}}$  long, 5-cleft, the basal appendages quite obsolete; petals hyaline, ovate to oblong or obovate, obtuse, sparsely ciliate on the edges above the middle: anthers 5, alternate with the petals, erect, quite a little shorter than the corolla; filaments inserted half way down on the corolla tube, glabrous,  $1^{\text{mm}}$  in length; anthers  $0.3^{\text{mm}}$  long, comparatively broad, apex obtuse,

base subcordate: ovary sessile, densely pubescent: style 1<sup>mm</sup> long, cleft into 2 recurved arms, terete, glabrous, persistent; stigma terminal, capitate: capsule 4<sup>mm</sup> in diameter, globular, sparsely ciliate: seeds compressed, carunculate.

Type specimen no. 4901, collected in May 1903, on Fremont's Peak of the Gabilan mountains, San Benito County, California.

It was observed only at the very summit of the peak, among the moss-covered rocks.

**Monardella franciscana**, n. sp.—A sprawling suffrutescent perennial: lower stems reclining on the ground or in dense herbaceous thickets, woody, one or more meters long; the leaf-bearing upper stems usually clustered, herbaceous, woolly pubescent, 2 to 3<sup>dm</sup> long, erect or decumbent near the base: leaves opposite, mostly fascicled, very variable in size, densely woolly pubescent on both sides especially beneath; the larger upper ones 2 to 3<sup>cm</sup> long including the 5<sup>mm</sup> long petiole, 2<sup>cm</sup> wide near the base, broadly ovate, entire or with a few obscure teeth, the edges recurved; the lower or axillary ones sessile, lanceolate to elliptic-obovate: inflorescence capitate; heads densely flowered, terminal, rarely more than one, 3 to 4<sup>cm</sup> in diameter, subtended by a whorl of pubescent leaf-like bracts equaling or exceeding the flowers; flowers upon stout short pedicels: calyx about 8<sup>mm</sup> long, the marginal ones usually curved upward, conspicuously 11 to 15-nerved, silky pubescent except near the base, tubular, equally 5-toothed; the teeth acute, 1.5<sup>mm</sup> in length: corolla blue or light pink, funnel-shaped, the longest 2<sup>cm</sup>, strigose about the middle, glabrous toward the base, bilabiate; upper lip 5<sup>mm</sup> long, erect or straight, apex 2-lobed; lower lip divided into 3 linear segments, equaling the upper lip, usually deflexed: stamens 4, fertile, moderately unequal, exerted and spreading; filaments slender, glabrous, inserted at the corolla throat or a trifle beneath it; anthers attached to the base, the cells somewhat recurved: style equaling the stamens, glabrous; stigma minute, terminal; ovary glabrous, distinctly 4-lobed.

Type specimen no. 4766, collected at San Pedro, San Mateo County, California, July 1903.

It was repeatedly observed in dense herbaceous growths in the ravines on the coast from San Francisco to Santa Cruz, and is a distinct seacoast species.

**HORKELIA BOLANDERI marinensis**, n. var.—Tufted perennial, 1 to 2<sup>dm</sup> high, villous pubescent: stems deflexed and more or less decumbent: leaves pinnately divided into 5 to 8 pairs of leaflets, subradical though often the stem bears as many as 3 to 5 leaves without subtending branches; average leaflets 10<sup>mm</sup> long, unequally 4 to 10-toothed; basal stipules narrowly linear, 10<sup>mm</sup> long, those on the stem broader and usually 1 or more-toothed: inflorescence branched from near the middle, corymbosely paniculate; branchlets loosely flowered: hypanthium longer than wide, saucer-shaped; bracts broad, 3-toothed: stamens 10, opposite the outer and inner series of sepals which must exceed them: outer sepals shorter, spatulate or acute at apex, pubescent on both sides; inner ones acuminate triangular, glabrous on the inner surface: filaments glabrous, flattened, slightly unequal in length; anthers introrse, short, elliptic: petals white, narrowly spatulate or oblanceolate, about equaling the sepals, early falling: styles many, glabrous, erect: seeds bean-shaped, smooth.

Type specimen no. 5039, collected in sandy soil at Point Reyes, Marin County, California, July 1903.

This variety has been distributed as *H. Parryi* (Wats.) Ryd. It has the pubescence of typical *H. Bolanderi* Gray, but the stems are more or less decumbent, basal stipules strictly linear and almost twice as long as in the species, leaflets larger and more toothed, and inflorescence more loosely corymbose and with larger hypanthia.

**Chrysopsis arenaria**, n. sp.—A wiry perennial herb, from creeping and much branched roots: stems 10<sup>cm</sup> long or very much shortened and bearing a dense rosette of leaves, erect or more often subreclining, hirsute: basal leaves soon withering; cauline ones many, ascending, obovate to oblanceolate, the lower ones slenderly attenuate from the base, alternate, entire, hispidly hirsute on both sides, ascending: heads heterogamous, terminating the stems, 1 to 3, barely exceeding the leaves, upon densely hirsute often glandular and few-bracteolate peduncles, 15<sup>mm</sup> in diameter, nearly that in length; involucre of several series, campanulate; bracts linear, imbricate, acuminate, pubescent, the longer ones 10<sup>mm</sup> in length and usually with pink scarious margins: receptacle flat, favose: ray flowers in one series, pistillate, showy; ligule yellow, 4-nerved, narrowly oblanceolate, entire, 6<sup>mm</sup> long; its tube slender, 5<sup>mm</sup> long, glab-

rous, expanded at base: style barely exceeding the throat, with short appendages: disk flowers many, all tubular, equaling the pappus, perfect, terminated by 5 acute teeth, 6<sup>mm</sup> in length, expanded at the base, yellow: anthers included, 2<sup>mm</sup> long, bases obscurely auricled, apex triangular, acute; filaments glabrous, inserted upon the tube one-third from the base: style much exceeding the tube, its arms flattened, short and truncate: achenes compressed, silky pubescent: pappus bristle-like, chiefly of two series, rusty or yellowish white, the longer series 5<sup>mm</sup> in length, finely scabrous, the basal one very short, lighter colored, smooth.

Type specimen no. 4556, collected at Point Reyes, Marin County, California, July 1903.

It forms dense prostrate mats on the windward side of the drifting sand dunes.

**Castilleia Wightii**, n. sp.—A tufted perennial herb, 3<sup>dm</sup> to 1<sup>m</sup> tall: stems several from the crown of the root, much branched from the base to the middle, glandular pubescent with dirty yellowish hairs: leaves alternate, sessile, quite membranous, pulverulent on both surfaces, or sparsely hairy along the 3 nerves, broadly linear to oblong, the larger ones 6<sup>cm</sup> long and 15<sup>mm</sup> wide, mostly with one pair of linear lateral segments from the middle of the leaf, the terminal lobe much longer and wider: inflorescence spicate, 10 to 20<sup>cm</sup> long, terminating the erect corymbosely disposed branches; subtending bracts barely equaling the flower, densely covered with glistening subglandular hairs, 3-nerved and 3-cleft, the upper ones with colored tips: calyx pubescent, laterally compressed and equally cleft nearly to the middle, the halves 2-toothed, subequaling the corolla: tube of corolla proper 10<sup>mm</sup> long, glabrous, saccate, its nerves prominent; galea or upper lip longer than the tube, quite broad and membranous at base, straight, its blunt apex rather thickened and retrorsely pubescent on the outer surface; lower lip 3-toothed, teeth 1<sup>mm</sup> long, obtuse, all alike: stamens equally inserted upon the middle of the corolla tube, the lateral pair a trifle shorter, the upper pair nearly equaling the galea and enclosed by it; filaments glabrous, flattened, with hyaline margins; anther cells broadest at base, subequally attached: style little protruding, flattened, glabrous, persistent, often recurved near the apex, bearing a capitate or obscurely flattened stigma; ovary smooth, somewhat compressed, acute toward the apex: cap-

sule 12<sup>mm</sup> long, ovoid, sharply pointed, coriaceous, loculicidal: seeds many, orbicularly compressed or somewhat elongated, with reticulate wings.

Type specimen no. 4761, collected on the trail between Spring Valley Lake and San Pedro, San Mateo County, California, July 1903.

It is a uniquely distinct subglandular species easily recognized by its abundant foliage, densely flowered elongated spikes, and broadly linear unequally 3-segmented leaves. Named for W. F. WIGHT, a former student of botany and classmate at Stanford University.

**Phacelia flaccida**, n. sp.—Delicate annual, 3 to 6<sup>dm</sup> high: stems sparingly but widely branched from the middle, rather weak and more or less reclining, rarely erect, beset with stinging white hairs: leaves few, alternate, usually subtending the branches, the larger ones 5<sup>cm</sup> wide and 7<sup>cm</sup> long, ovate to elliptic in outline, very thin and flaccid, only sparsely setigerous on both surfaces, 3 to 5-pinnately nerved, obscurely lobulate, the margins with irregular low roundly obtuse teeth, base rounded or obscurely and unequally subcordate; longer petioles 4<sup>cm</sup> in length, setose, the younger ones cinereously pubescent: inflorescence usually dichotomously branched; flowers secund, not crowded, upon short ciliate pedicels: calyx of 5 persistent herbaceous distinct segments, the 4 smaller ones oblanceolate and in the mature state 7<sup>mm</sup> long, bristly ciliate: corolla barely exceeding the calyx, 3<sup>mm</sup> long, blue or pale white; the 5 segments short-ovate and comparatively very broad: stamens well included within the tube, alternating with the segments and inserted near the base of the tube; anthers short-elliptic, versatile; filaments nearly equal, glabrous, usually curved above the middle, subtended by small hyaline entire membranous folds: ovary persistent, pubescent; style persistent, equaling the anthers, cleft almost to the base, each division bearing a minute terminal stigma: capsule ovoid, 1-celled, divided into 2 valves, 1-seeded in each; seeds brown, flattened, 2<sup>mm</sup> long, obscurely pitted.

Type specimen no. 4404, collected at Wright's Station, Santa Clara County, California, June 1903.

This delicate species was discovered in a damp deeply shaded nook on the banks of Los Gatos Creek. Otherwise not known.

**Leptosyne Hamiltonii**, n. sp.—Glabrous acaulescent annual: leaves tufted, all radical, mostly erect, rather thick, 2 to 3<sup>cm</sup> long

including the 1 to 2<sup>cm</sup> long flattened petiole; blade proper triangular-ovate in outline, 1<sup>cm</sup> long, fully as wide at base, 2 to 3-pinnately divided; the segments not wider than the petiole and the rachis, 1<sup>mm</sup> wide, ultimate ones short, with bluntly rounded apices: scapes usually 1 to 3 from each root, glabrous, 10 to 18<sup>cm</sup> long, slender, usually somewhat curved, each bearing an erect solitary head; heterogamous heads subcampanulate or cup-shaped, 1<sup>cm</sup> in diameter, a trifle less than 1<sup>cm</sup> in height; involucre glabrous, truncate and united at the base, in two series; bracts of lower series 5, thickish, linear, obtuse, 4<sup>mm</sup> long, dark brown; inner series of 8 to 10 striate bracts, shining, yellowish, about 10<sup>mm</sup> long, 4<sup>mm</sup> wide, submembranous, oblong, acute: ray flowers about a dozen or more, pistillate and fertile; tube 1.5<sup>mm</sup> long, subglabrous; branches of stigma barely exerted, recurved; ligule 3 to 4<sup>mm</sup> wide, 6<sup>mm</sup> long, elliptic to oblong or obovate, apex round, usually with a short obtuse tooth: scales equaling the flowers, subpersistent, linear, hyaline, obtuse, 3-nerved, those of the central flowers narrower: central flowers crowded, perfect, sterile, tubular; tube 4<sup>mm</sup> long, hyaline, cylindrical, the upper half subinflated, its 5 teeth obtuse and more or less thickened along the margins: anthers linear, 2<sup>mm</sup> long, truncate at base, apex triangularly appendaged: style equaling the stamens, its 2 branches short, obtuse, and flattened; achenes linear-obovoid, compressed, marginally winged, ciliate on the edges, pubescent on the sides, brown and glabrous when mature: pappus of 2 caducous hyaline finely ciliate membranes.

Type specimen no. 2328, collected on Mt. Hamilton, Santa Clara County, California, April 1900.

It was in fine flower and fruit, and grew in dry gravelly soil on a steep slope a few hundred yards below the observatory. Since then I have failed to find it either in this same place or elsewhere.

#### EUNANUS ANDROSACEUS Curran.

This southern species was originally discovered at Tehachapi, California. From the middle western part of the state it is only known at Ben Lomond, Santa Cruz County, where fruiting specimens were collected by Mrs. K. Brandegee in April 1890. In July 1903 the writer found excellent flowering specimens in the same locality, which were distributed under no. 4519. It is evidently rare and prefers hot and dry gravelly soil of the chaparral formation. The plants were from 1 to 10<sup>cm</sup> high, with single or branched stems, glandularly pubescent or the



older ones subglabrous: leaves sessile, obovate or linear-oblong, entire or obscurely apiculate above the middle, apex obtuse, attenuate toward the base, 5 to 20<sup>mm</sup> long, the larger ones 5<sup>mm</sup> wide: pedicels of solitary axillary flowers not exceeding 5<sup>mm</sup> in length: calyx 8<sup>mm</sup> long, compressed, somewhat inflated below the middle; the two upper parallel lobes a trifle longer than the lower and lateral ones, with 5 short and obtuse teeth: crimson corolla little exceeding the calyx, slenderly tubular, conspicuously constricted below the limb, pubescent on the exterior; limb barely bilabiate, the broadly rounded segments rotately spreading: stamens 4, all anther-bearing; filaments slender, inserted upon the corolla at the middle; anthers 0.5<sup>mm</sup> long, comparatively broad, widely spreading: style glabrous, erect, bearing flattened lobed stigmas; ovary smooth, conically elongated.

#### LUPINUS POLYPHYLLUS Lindl.

This magnificent seacoast lupine was found as far south as San Pedro, San Mateo County, California, May 1903. At this station it grew in wet adobe soil, reached a height of 2<sup>m</sup>, and is succulent and apparently an annual. The larger leaves were of an enormous size, and some of the flowering spikes exceeded the length of a man's arm. Flowers large, dense, with blue wings and purplish banner. Pods persistent, densely covered with soft long yellowish-white hairs. Distributed under no. 4444.

#### CAMPANULA EXIGUA Rattan.

No. 4357 was collected in May 1903 along La Puerta Creek, Stanislaus County, California. It was found on a dry mountain side composed chiefly of small rocks, and on gravelly embankments of the creek. At first it reminded me of a *Gilia* in growth and habitat. The flowers are large and showy: corolla bluish white, at first appearing tubular, ultimately campanulate: styles wholly included, bearing 3 revolute stigmas; dilated bases of the filaments not ciliate; capsule dehiscent regularly on the sides, 3-celled; seeds numerous, 0.75<sup>mm</sup> long, half as wide, compressed, shining light brown, inserted upon 3 conspicuously enlarged placentae centrally attached to the main axis.

#### SALIX BREWERI Bebb.

The type of this willow was collected by W. H. BREWER on San Carlos Mountains of middle California, and described in *Bot. Calif.* 2:88. 1880. Since then it has been reported from only a few localities. In May 1903, while making a botanical trip from Livermore, California, through San Antonio and Adobe valleys, I found it in fine fruit, and distributed it under no. 4648. It is quite abundant along the Little Colorado, Sweet Water Creek, and on the headwaters of the La Puerta, all of which rise on Red Mountain, Santa Clara County, California. This species was at once distinguished from the other willows, and bears a remarkable similarity to *Salvia mellijera* Greene.

It is a shrub 1 to 2<sup>m</sup> high, rather gracefully branched from near the base;

branchlets sparsely branched, erect, about as tough as the western leatherwood (*Dirca occidentalis* Gray), cinereous pubescent: leaves terminally clustered, subsessile, linear to oblanceolate, acute, the larger ones 6<sup>cm</sup> in length and 10<sup>mm</sup> in width, densely canescent beneath, upper surface green and becoming glabrous except the sunken cinereous midnerve, margins entire or sometimes remotely apiculate: fruiting spikes immediately beneath the foliage, the short peduncle subtended by 3 foliaceous bracts, curved and slenderly elongated, 5 to 7<sup>cm</sup> long, 10<sup>mm</sup> in diameter, densely flowered: capsules short-canescant all over, 5<sup>mm</sup> long including the very short pedicel, conspicuously compressed, lateral face ovoid, acuminate; styles persistent, not longer than 1<sup>mm</sup>, 2-cleft, each segment again divided into recurved lobes: bracts spatulate or obovate, long ciliate pubescent; axillary gland persistent, quite prominent and cinereous.

#### CUPRESSUS GOVENIANA Gord.

About sixteen miles southeast of Livermore, Alameda County, California, is a mountain commonly known as Cedar Mountain. While collecting on this mountain during the latter part of May 1903, I did not find any true cedars, but found near the round-topped summit quite an area densely covered with a species of cypress. It was too late for staminate flowers, but an abundance of mature cones was collected. The trees are mostly of a young generation, of all sizes from 3<sup>m</sup> to 5<sup>m</sup> high and cone-bearing, widely branched from near the ground, the terminal portion of the stem much exceeding the shortest uppermost branches; leaf branchlets slender, more or less spreading: leaves without conspicuous dorsal pits, acute, shining green: cones globose, 13<sup>mm</sup> in diameter; the 8 unequally sized scales grayish-white on the outside, almost smooth or only with low umbos: seeds angular, prominently margined or winged along the lateral edges above the middle, reddish-brown and frequently somewhat glaucous, with a resiniferous odor.

This species was distributed under no. 4487. There is some doubt as to this determination, and its relationship to the other closely allied species is not as yet clearly understood. These flourishing trees might have been planted at some very early date.

#### MUHLENBERGIA DEBILIS Trin.

The distribution of this handsomely tufted grass is given from Texas to southern California. In May 1902 the writer found it in abundance on a dry gravelly hillside near Santa Barbara, California. In June 1903 a few dwarfed specimens were discovered on a cliff at Carmel Bay. The latter locality is its most northern known limit along the coast.

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